Gastropericardial fistula after laparoscopic surgery for gastroesophageal reflux disease

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Since the 1990s, laparoscopic antireflux surgery has gained in popularity. Many studies have demonstrated the safety and efficacy of this minimal procedure. However, long-term failure rates and complications range from 4.5% to 12.5% in larger series.[1,2] Some of the postoperative complications are specific to laparoscopy. Paraesophageal hiatal hernia (PEHH), or "slipped wrap," is rarely reported with open procedures, and it can cause substantial life-threatening morbidity.[3,4] We report a case of gastropericardial fistula with acute respiratory distress syndrome complicating a PEHH 7 years after laparoscopy.

Clinical Summary

A 36-year-old man was admitted to our emergency department with clinical and radiologic findings of acute respiratory distress syndrome. He underwent a laparoscopic Nissen fundoplication for symptomatic refractory gastroesophageal reflux disease (GERD) 7 years previously: The diaphragmatic crura were not closed (hiatus normally narrowed), and 3 nonabsorbable sutures allowed a 4-cm–long fundoplication. Five years later, he had increasing pain in the left shoulder. The extensive assessment (computed tomography scan, magnetic resonance imaging, and arthroscopy) found no cause. Since then, the pain had recrudescence periods that were calmed with a major antalgic. Three weeks before admission, he had malaise with tachycardia, but he ignored it. Three days before admission, he had fever, chest pain with a cough, and vomit with blood traces. He reached the regional hospital where a primary checkup was performed. Respiratory insufficiency quickly developed in the patient, and intubation was performed; he was then transferred to our department.

At admission, biology showed inflammatory syndrome (white blood count = 20×10^9/L, C-reactive protein = 395 mg/L, fibrinogen = 10 g/L), respiratory acidosis (pH = 7.22), and anemia (hematocrit = 26%, hemoglobin = 5.4 g/L). The chest radiograph showed bilateral infiltrates and pneumopericardium (Figure 1). The computed tomographic scan (made at the regional hospital without ingestion of contrast product) added bilateral pleural effusion, Nissen fundoplication, and suggested a gastropericardial fistula (Figure 2). We decided to perform surgery immediately.

At thoracotomy, an inflammatory block surrounding the hiatal region toward the pericardium was found. The pulmonary ligament was cut, and the lower esophagus was identified and encircled below the pulmonary veins. Further dissection showed that the half-wrap migrated across the hiatus fistulizing to the pericardium (diameter < 1 cm). A small radial phrenectomy was made to identify the structures and enable repair. The fistula was removed by stapling. Finally, we maintained the antireflux wrap reduced beneath and fixed to the diaphragm. At the end of procedure, the pericardium was left open and the phrenectomy was closed. The histopathology of the resected specimen showed a typical gastric ulcer.

The postoperative period was difficult: intubation was maintained for 1 week, tracheotomy was required, and hemodialysis was necessary for acute renal insufficiency. The patient left the hospital after 40 days; the barium esophagography was normal.

Discussion

Currently, laparoscopic repair (primarily Nissen fundoplication) is the procedure of choice for uncomplicated, refractory GERD. More than 90% of patients have had long-term positive outcome and satisfactory results.[1,2] Failure rates and complications are still present, some specific to laparoscopy. Rarely reported with open procedures, PEHH accounts for up to 7%. Moreover, this complication seems to be more frequent in GERD without hiatal hernia.[1] During laparoscopy, the elevated pressure caused by the peritoneum, extensive esophageal dissection, and failure to close the hiatus are possible explanations for this complication. Also, early retching or straining can push the stomach into the thorax.[2]

An early sign of "slipping" hernia can be pain in the left shoulder. Our patient had chronic pain during the last 2 years.

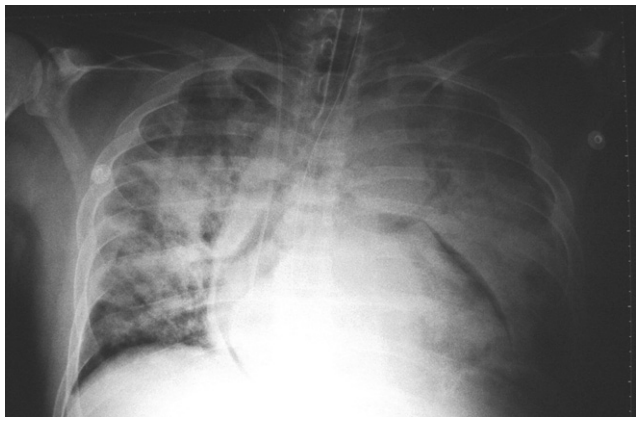

Figure 1. Chest radiograph shows the pneumopericardium.

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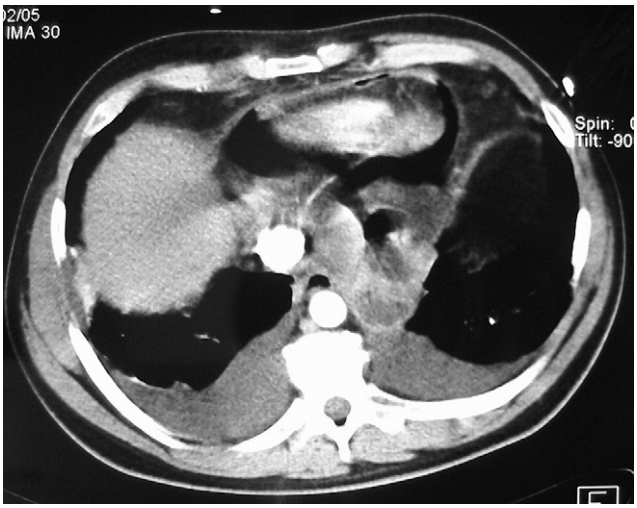

Figure 2. Computed tomographic scan suggests the gastropericardial fistula.

Possible explanations could be chronic irritation of the diaphragm or the right crus, parahiatal scarring, and fibrous adhesions between the stomach and the pericardium. Furthermore, a narrowed hiatus engaged chronic ischemia in the "slipped wrap" and favored ulcer formation near the diaphragm. Perhaps the classic ulcer epigastric pain of the normally situated stomach become projected in the left shoulder because of chronic irritation of the diaphragm. Frequently, the ulcer is situated at the lesser curvature[3] or fundus.[5]

Our patient presented with a wrap ulcer. We found only one case of wrap ulcer, but it occurred in the early postoperative period.[4] In our case, the complication occurred late after surgery.

Pneumopericardium is rarely encountered in clinical practice. When a benign gastropericardial fistula is suspected, a water-soluble contrast should be used. The rationale for gastroscopy is questionable. It can visualize the fistula, but air insufflation could provoke tension pneumopericardium and consequent tamponade.[5]

The mainstay treatment of gastropericardial fistula is prompt surgery. In our case, we repaired the wrap and placed it beneath the diaphragm.

Despite excellent results, the "slipped wrap" is the Achilles' heel of laparoscopic fundoplication. Systematic reinforcement of the hiatus is mandatory even when GERD is not associated with hiatal hernia. This reduces the incidence of PEHH and subsequent serious morbidity.

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